

**Green card sort**

1. She pays £35.60 for 40 songs.

In April, she pays 5p more for each song.

She has a £30 voucher.

What is the maximum number of songs she can download using the voucher?



**Blue card sort**

2. In 2012 electricity cost 15p per unit.

A family used 3729 units.

In 2013 electricity cost 17p per unit.

The family used 3506 units.

How much more did the family pay for electricity in 2013?



3. Sam spends exactly £20 on petrol.

The petrol costs £1.45 per litre.  
Work out the number of litres of petrol she buys.  
Give your answer to 1 decimal place.

Find the number of litres of petrol Sam can buy with £20

Give your answer to the required degree of accuracy.

4. A bakery makes 480 pizzas and 2400 rolls each day.

In 1 hour each baker can make 20 pizzas or 75 rolls.  
Each baker works for 8 hours a day.



Work out the minimum number of bakers needed each day.

Find how many hours it takes a baker to bake 480 pizzas

Find how many hours it takes a baker to makes 2400 rolls

Find the total number of hours for a day (480 pizzas and 2400 rolls)

Find out how many bakers are required if each baker works 8 hours

5. A house is being built.

8400 bricks will be laid.

Three bricklayers will:

- each lay 350 bricks per day
- each be paid £115 per day.

How much in total will they be paid?



Additional questions

6. The cost of fuel is £1.10 per litre.

1 gallon = 4.5 litres

a. Work out the cost of 1 gallon.

b. A car travels 35 miles per gallon of fuel.

How many gallons are used for a journey of 105 miles?

7. 1 mile = 5280 feet

1 foot = 12 inches

1 inch = 2.54 cm

Use the given conversions to show that 1 mile is approximately 1600 metres.

8. 2 tubs of ice cream cost £5.90

How much would 5 of these tubs cost?

9. Rob is going to drive 130 miles from Hull to Liverpool.

There are road works for 25 miles of the journey.

He assumes his average speed will be

- 50 mph where there are road works
- 70 mph for the rest of the journey.

Using his assumptions, work out his journey time.



## Answers

- |                |  |                                     |
|----------------|--|-------------------------------------|
| 1. 31 songs    | 5. £920                                    | 8. £14.75                           |
| 2. £36.67      | 6. £4.95    b) 3 gallons                   | 9. $(105 \div 70) + (25 \div 50) =$ |
| 3. 13.8 litres | 7. $5280 \times 12 \times 2.54 \div 100 =$ | 2 hours                             |
| 4. 7 bakers    | 1609.344m                                  |                                     |

## Staged Problem solving teacher's notes:

## The resources for each topic include:

## 1. A set of problems (word document)

- First two problems are supported with a card sort which includes a description about what you are doing and the calculation necessary for each stage.
- Two further problems with a tabulated structure including the description of each stage (no calculation or formula given).
- Unstructured question(s) - for pupils to systematically solve. Additional questions are not included on the ppt and could be printed separately (to reuse perhaps).

## 2. Cards sorts (word document)

- Colour coded so that the students can distinguish between problem 1 and 2 solution but the teacher can print on single pages.
- Alternatively, this document can be adapted so that all of one problem is printed on coloured paper (this will cost less in printer ink).

## 3. PowerPoint

- For question 1 and 2 the correct order for the card sort is given followed by the mark allocation.
- For question 3 and 4 solutions are added step by step followed by the mark allocation.
- For Question 5 - a table describing each step, followed by each stage of the working and finally the mark allocation.

## Card sort, Structured stages, independence

The structure of the materials is to enable learners to access problems and encourage them to systematically record solutions before they are asked to complete unstructured questions independently.

The card sort includes both the working and a description for each stage of the solution. Students are asked to order the solution in a logical step by step manner.

The second phase give students a table describing what they should be doing but does not include formulas or working.

The final phase gives students unstructured problems for them to systematically record their own solution.

## Card sort

1.

Find the cost of 1 song	$£35.60 \div 40 = 0.89$
State the cost per song in April	$0.89 + 5p = 0.94$
Find the number of songs you can buy with £30	$30 \div 0.94 = 31.915$
State the minimum number of songs she can download	32 songs minimum

2.

Find cost of electricity in 2012	$3729 \times 0.15 = £559.35$
Find the cost of electricity in 2013	$3506 \times 0.17 = £596.02$
Find the difference between cost in 2012 and 2013	$596.02 - 559.35 = £36.67$